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# BORROWER RATING RELATED TO CREDIT RISK IN COMMERCIAL BANKS

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## ABSTRACT

Credit Risk is a risk that occurs when a lender or borrower fails to make payment or interest on time to the banks. This also decreases the overall rating of banks. At present most of the banks are facing that risk at large risk by having appropriate guidelines. So it is measured that such guidelines are not fruitful that is why a new approach to judge the borrower, in different manner inspired by the FICO score, is proposed. In this article a meeCheck model is proposed to calculate the overall rating of the borrower with reference to their past credit records along with total assets, total saving, total loans and also yearly expenses of the borrower. A model based formulae are given to easily rate the borrower in the scale of 10.

**KEYWORDS:** Credit Risk, FICO Score, Moody's Rating, MeeCheck Borrower Rating Model, Borrower Rating Criteria

## INTRODUCTION

While financial institutions have faced difficulties over the years for a multitude of reasons, the major cause of serious banking problems continues to be directly related to lax credit standards for borrowers and counterparties, poor portfolio risk management, or a lack of attention to changes in economic or other circumstances that can lead to a deterioration in the credit standing of a bank's counterparties.

Credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. The goal of credit risk management is to maximize a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Credit Risk is the potential that a bank borrower/counter party fails to meet the obligations on agreed terms. There is always scope for the borrower to default from his commitments for one or the other reason resulting in crystallization of credit risk to the bank.

## LITERATURE REVIEW

Chaturvedi and Rastogi [1] explained about the risk management in commercial banks and the issues to manage these risks. In their article, they also described the credit risk along with issues and challenges to manage credit risk. They said that the credit risk arises from the potential that an obligor is either unwilling to perform on an obligation or its ability to perform such obligation is impaired resulting in economic loss to the institution. They categorized credit risk in two types

- Borrower Risk
- Industry Risk

A credit rating [4] is process of evaluation of risk associated with financial institution. These rating is based on the borrowing and lending that has been done in past by a company or government but not by an individual customer. These rating are not based on the mathematical formulae. These ratings are based on detailed analysis done by various credit rating agencies Standard and Poor's company, Moody's Investor Service and ICRA etc.

Altman, Caoette & Narayanan [2] said about the important factors involved in credit risk management system. According to them these factors are method of credit scoring, evaluation of harmful measures probabilities and subsequent losses due to these harmful measures. Campbell [3] said that in most of the studies it is described to concentrate on issues of developing an efficient model for releasing of bad debts instead of the legal and rigid framework to control and prevent.

## OBJECTIVE OF RESEARCH

The objective of this study is to propose a different approach using FICO score and Moody's credit rating to minimize credit risk

- Study of FICO score rating.
- Study of Moody's Credit Rating.
- Development of Borrower rating model to minimize credit risk.

## FICO SCORE

In U.S. more than 90% lending decision is based on the FICO score. FICO credit score is developed by Fair Isaac Company. The development of credit risk scoring by Fair Isaac is treated as revolution for financial service industries. Presently, Fair Isaac's FICO is widely recognized as a standard for lenders. FICO score ranges from 300 to 850. The FICO score is calculated based on the credit report of an individual with that agency. FICO score is calculated with several piece of data related to individual's credit report. FICO score is calculated based on five criteria-

- Payment History
- Amount Owed
- Length of Credit History
- New Credit
- Types of Credit Used

These five criteria have different weightage in contribution to overall FICO score.

## MOODY'S RATING

Moody's [5] rating is given by moody's investor service. Moody's investor service is one of the world's leading credit rating, research and risk analysis firm. It is a subsidiary of Moody's Corporation. Presently Moody's rating and analysis track debt covers 115 countries, 10000 corporate issuers, 22000 public finance issuers and 82000 structured financial obligations. According to Moody's[6], the simple process of rating is to gauge the creditworthiness of securities.

The gradation of creditworthiness is indicated by rating symbols. Each symbol represents a group in which credit characteristics are generally same. There are nine credit symbols [7] like Aaa, Aa, A, Baa, Ba, B, Caa, Ca, C. Moody'

s appended numerical value 1, 2 and 3 with rating symbols Aa through Caa. In this lower the number means the higher end of risk category or symbol.

## MEECHECK BORROWER RATING MODEL

In this section a model or some formulae are proposed to rate the borrower in the scale of 10 so that the credit risk to the banks can be reduced. The proposed model works on five different criteria and having different weightage of these criteria to contribute the borrower's rating. The five criteria are as follows-

- Payment Record
- Assets
- Credit Length
- New Credits
- Number of credit used

These criteria have different percentage in contribution to calculate overall rating of a borrower. The contribution percentage can be shown by a below given diagram-

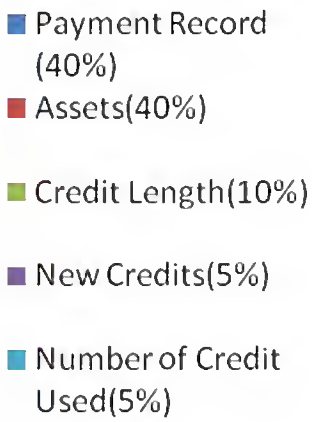


**Figure 1: Rating Model Criteria**

## PAYMENT RECORD

Payment record means that the information about repayment history of loans of the borrower's. This has 40% weightage in overall rating or having 4 scales out of 10. To calculate this formula is proposed below-

$$PRW = 4 * \left(\frac{TP - DP}{TP}\right)$$

TP means the total equally monthly installments that have been paid by a borrower and DP means the delayed equally monthly installment that have been paid by a borrower after a given date along with late fines.

Suppose if a borrower made total 60 payments out which 7 are delayed and rest 53 are on time then

*PRW = 4*(60-7)/60*

*= 4*53/60 = 3.53*

## ASSETS

It includes the total monetary assets along with the other investment that can be helpful to recover an amount of loans. In this a yearly salary can be added but if some assets are mortgaged with other financial institution that will not be included in total assets as they have already been mortgaged. This is having 4 scales rating out of 10 or we can say it has a huge effect on overall rating as it contains 40% weightage.

$$AW = 4 * \left(\frac{TA - TOL}{TA}\right)$$

$$TA = (TP + YI)$$

TA includes the total property that have owned by a borrower and yearly income of a borrower. This can be taken in any case like individual or an institutional. Total property means the assets that can be treated as a security against of a loan and yearly income can be taken in account of repayment of a loan.

Suppose any individual has total property of 50 Lac, total outstanding loan of 12 Lac and yearly taxable income is 6 Lac. Then the calculation can be done in easy manner like-

$$AW = 4 * \frac{5000000 + 600000 - 1200000}{5600000}$$

= 4*(5600000-1200000)/5600000

= 4*4400000/5600000 = 17600000/5600000

= 3.14

So the score of assets will be 3.14 out of 4 that will be added in the total score.

## CREDIT LENGTH

Credit length means that if a borrower has loan for a long period then the score will be lesser but if having lesser term period then the score will be higher. This criterion is having 10% of weigthage or 1 scale value out of 10. It can be simply calculated by a produced formula given below-

$$CLW = \left(\frac{TL(loan) - LR(loan)}{TL(loan)}\right)$$

In above formula TL (loan) means that the tenure of each outstanding loan of a borrower and LR(loan) means the tenure remaining of outstanding loans of a borrower.

Suppose if a borrower has three outstanding loans with duration of 20, 10 and 5 years then the total length of loan will be 35 and remaining length is 10 year of 20 year loan, 4 year of 10 year loan and 2 year of 5 year loan so the length remaining of loan will be 10+4+2=16 -

So

$$CLW = \left(\frac{35 - 16}{35}\right)$$

= 19/35

=0.54

Then,

CLW=0.54 which will be added in the total score.

## NEW CREDIT

New Credit illustrate that a recent credit that is owned by a borrower. In this if a borrower has large number of recent credits then the score will be less and if borrower has less or zero number of recent credits then the score will be higher in this criterion. Here recent credit includes only the past year credits owned by a borrower. The total weightage of new credit in total score is 5% or 0.5 scale value out of 10. It can be calculated by a given formula-

$$NCW = \frac{\left(1 - \left(\frac{1}{1 + \left(\frac{1}{CU}\right)}\right)\right)}{2}$$

CU means the loan obtained during the past year as the weightage of new credit is inversely proportional to credit used. But we can take NCW as inversely proportional to CU because if the value of CU is zero then the NCW will be infinite that is not possible that is why above formula is designed in such a manner so the value in any case will be vary from 0 to1 of and further it is divided by 2 so that the overall value of NCW varies from 0 to 0.5.

Suppose, a borrower obtained 2 loans during the past year then the new credit weight which contribute in overall rating will be-

$$NCW = \frac{\left(1 - \left(\frac{1}{1 + \left(\frac{1}{2}\right)}\right)\right)}{2}$$

$$= \left(\frac{1 - \left(\frac{1}{\frac{2+1}{2}}\right)}{2}\right)$$

$$= \left(\frac{1 - \left(\frac{2}{3}\right)}{2}\right)$$

$$= \frac{\left(\frac{3-2}{3}\right)}{2}$$

$$= \frac{1}{6}$$

=0.166 = 0.17

NCW = 0.17 or 0.2(approximate).

## NUMBER OF CREDIT USED

Number of credit used said that how many loans have been taken by a borrower. This criterion has 5% of

weightage in overall rating or we can say that it has 0.5 scale value out of 10. According to this criterion if a borrower has used more number of credits then his score will be less in this criterion and if he used less number of credits then his score will be higher. This score also depends on the outstanding loans of a borrower. The calculation can be done in easy manner by a proposed formula given below-

$$CUW = \frac{\left(\frac{TC - OC}{TC}\right)}{2}$$

TC means that number loans have been taken by a borrower during past and OC means how many loan are still continuing, it can be simply calculated by subtracting finished loan from total credit.

Suppose a borrower used total 12 credits and out of this 5 has been terminated by paying all dues. So the credit used weight will be-

$$CUW = \frac{\left(\frac{12 - 5}{12}\right)}{2}$$

$$= \frac{\left(\frac{7}{12}\right)}{2}$$

$$= \frac{7}{12 * 2}$$

$$= \frac{7}{24}$$

=0.29

So, as result the

TS(b) = PRW+ AW+ CLW+ NCW+ CUW

Total score value will range from 0 to 10. So that a rating is proposed for these values that will simply describe the risk percentage and also rate the borrower. This rating is done by nine rating symbols like A+, A, A-, B+, B, B-, C+, C, C-. These symbols describe the lowest risk to highest risk for A+ through C-.

The significance of each symbol related to the total weight is given in following table

**Table 1: Borrower Rating Criteria**

| Rating Symbol | Total Score | Significance |
|---|---|---|
| **A+** | 9.5 - 10 | Highest quality and lowest credit risk. |
| **A** | 9.0-9.49 | High quality and low credit risk. |
| **A-** | 8.1-8.99 | Upper medium grade and low credit risk. |
| **B+** | 7.6-8.0 | Medium grade and moderate credit risk. |
| **B** | 7.1-7.5 | Upper Lower grade and Significant credit risk. |
| **B-** | 6.1-7.0 | Low grade and medium credit risk. |
| **C+** | 5.49-6.0 | Low Grade and High credit risk. |
| **C** | 5.1-5.49 | Lowest grade and High credit risk. |
| **C-** | >5.0 | Lowest Grade, Very High Credit Risk and low likelihood of recovering interest and principle. |

## CONCLUSIONS

Credit risk management is the most important part of risk management. It is mandatory to assess the borrower in a well planned manner to reduce the credit risk in commercial banks. This also helps to improve the overall rating of particular commercial banks.

In this paper a model and rating method is proposed to assess a borrower in proper manner with reference to their credit history. In this proposed model number of factors has been taken that is related to the borrower. A proposed model helps to calculate the score of the borrower which is related to his past credit record. This score is further useful to assign a rating to a borrower with some specific rating symbols. These rating symbols are also proposed in this model and have a specific significance which will be helpful to understand the risk level that can be associated with borrower in future.

This paper will be useful for commercial banks to rate the borrower using this approach so that the credit risk occurrence in commercial risk can be reduced at extent level and also helpful in increase the overall rating of banks.

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